Listing of Claims:

1. (Currently Amended) A total internal reflection fluorescence microscope comprising:

at least one objective lens which takes light from a specimen;

an image pick-up device which picks up an image of the light taken into the objective lens;

an observation optical path via which the light taken into the objective lens is condensed onto the image pick-up device;

a condenser lens, which is disposed in a position facing the objective lens via the specimen, which has a numerical aperture that makes possible total internal reflection illumination, and which guides a transmitted illuminative light, which is emitted by a light source, into the specimen;

a base including an upper portion that holds the condenser lens;

a laser oscillation unit which outputs a laser beam;

an optical fiber which transmits the laser beam output from the laser oscillation unit;

a reflection mirror provided at a lower portion of the base to ~~introduce~~ reflect the laser beam output from the optical fiber along a path substantially parallel to a light path of the transmitted illuminative light from the light source, so as to

introduce the laser beam into a vicinity of an outermost ~~portion~~ side of the condenser lens;

a condensing lens which condenses the laser beam output from the optical fiber, such that the laser beam is condensed at a condensing position in a vicinity of a front focal position of the condenser lens; and

a mirror moving section which moves the reflection mirror in a translatory manner, with respect to the condensing lens, in a direction that is substantially perpendicular to ~~a~~ the light path of the transmitted illuminative light from the light source, such that when the mirror moving section moves the reflection mirror, the path of the laser beam reflected by the reflection mirror remains substantially parallel to the light path of the transmitted illuminative light,

wherein when the mirror moving section moves the reflection mirror with respect to the condensing lens, an incidence angle, at a boundary of the specimen, of the laser beam emitted from the condenser lens is changed, thereby changing a leak-out depth of evanescent light that illuminates the specimen.

Claims 2 and 3 (Canceled).

4. (Withdrawn) The total internal reflection fluorescence microscope according to clam 1, further comprising a conversion lens unit which converts a numerical aperture of the laser beam

incident upon the condensing position without changing the condensing position of the laser beam.

5. (Withdrawn) The total internal reflection fluorescence microscope according to claim 4, wherein the conversion lens unit is removably inserted between an emission end of the optical fiber and the condensing lens.

6. (Withdrawn) The total internal reflection fluorescence microscope according to claim 4, wherein the conversion lens unit includes a lens group which converts a numerical aperture of the laser beam incident upon the condensing position.

7. (Withdrawn) The total internal reflection fluorescence microscope according to claim 4, wherein the conversion lens unit comprises:

a convex lens which converts the numerical aperture of the laser beam diverged and emitted from an emission end of the optical fiber; and

a concave lens which diverges the laser beam having the numerical aperture converted by the convex lens.

8. (Withdrawn) The total internal reflection fluorescence microscope according to claim 7, wherein the concave lens is

movable in an optical path direction of the laser beam between the convex lens and the condensing lens.

9. (Withdrawn) The total internal reflection fluorescence microscope according to claim 5, wherein the at least one objective lens comprises a plurality of objective lenses having different observation magnifications, and the microscope further comprises:

an objective lens switching section which selectively disposes one of the plurality of objective lenses on the observation optical path; and

a control section which controls inserting and removing of the conversion lens unit between the emission end of the optical fiber and the condensing lens in accordance with the observation magnification of the objective lens disposed on the observation optical path.

10. (Withdrawn) The total internal reflection fluorescence microscope according to claim 9, wherein the plurality of objective lenses include at least one objective lens for high-magnification observation and at least one objective lens for low-magnification observation, and

wherein the control section inserts the conversion lens unit between the emission end of the optical fiber and the condensing

lens when the objective lens for high-magnification observation is disposed on the observation optical path, and the control section removes the conversion lens unit from between the emission end of the optical fiber and the condensing lens when the objective lens for low-magnification observation is disposed on the observation optical path.

11. (Withdrawn) The total internal reflection fluorescence microscope according to claim 10, wherein an irradiation range of the laser beam with respect to the specimen is caused to agree with an observation range of the objective lens for high-magnification observation when the conversion lens unit is inserted between the emission end of the optical fiber and the condensing lens, and the irradiation range of the laser beam with respect to the specimen is caused to agree with an observation range of the objective lens for low-magnification observation when the conversion lens unit is removed from between the emission end of the optical fiber and the condensing lens.

12. (Withdrawn) The total internal reflection fluorescence microscope according to claim 1, further comprising a zoom lens unit which adjusts the condensing position of the laser beam in the vicinity of the front focal position of the condenser lens.

13. (Withdrawn) The total internal reflection fluorescence microscope according to claim 12, wherein the zoom lens unit comprises a lens group which adjusts the condensing position of the laser beam in the vicinity of the front focal position of the condenser lens.

14. (Withdrawn) The total internal reflection fluorescence microscope according to claim 12, wherein the zoom lens unit comprises:

a convex lens which converts the numerical aperture of the laser beam diverged and emitted from an emission end of the optical fiber; and

a concave lens which diverges the laser beam having the numerical aperture converted by the convex lens.

15. (Withdrawn) The total internal reflection fluorescence microscope according to claim 14, wherein the convex lens is movable in an optical path direction of the laser beam between the emission end of the optical fiber and the condensing lens.

16. (Withdrawn) The total internal reflection fluorescence microscope according to claim 14, wherein the concave lens is movable in an optical path direction of the laser beam between the convex lens and the condensing lens.

17. (Withdrawn) The total internal reflection fluorescence microscope according to claim 14, further comprising:

a control section which determines a moving position of the concave lens to adjust the condensing position of the laser beam in the vicinity of the front focal position of the condenser lens in accordance with positional movement of the convex lens, and which controls movement of the convex lens and the concave lens based on information of the determined moving position of the concave lens.

18. (Withdrawn) The total internal reflection fluorescence microscope according to claim 13, wherein the at least one objective lens comprises a plurality of objective lenses having different observation magnifications, and the microscope further comprises:

an objective lens switching section which selectively disposes one of the plurality of objective lenses on the observation optical path; and

a control section which determines a relative positional relation of the lens group disposed in the zoom lens unit in each optical axis direction in accordance with an observation magnification of the objective lens disposed on the observation optical path.

19. (Withdrawn) The total internal reflection fluorescence microscope according to claim 18, wherein the lens group of the zoom lens unit comprises:

a convex lens which converts the numerical aperture of the laser beam diverged and emitted from an emission end of the optical fiber; and

a concave lens which diverges the laser beam having the numerical aperture converted by the convex lens, and

wherein the control section determines a moving position of the concave lens to adjust the condensing position of the laser beam in the vicinity of the front focal position of the condenser lens in accordance with positional movement of the convex lens, and the control section controls movement of the convex lens and the concave lens based on information of the determined moving position of the concave lens.

20. (Withdrawn) The total internal reflection fluorescence microscope according to claim 1, wherein the laser oscillation unit, the optical fiber, the reflection mirror, the mirror moving section, and the condensing lens form at least a part of a laser introduction section, and the microscope comprises a plurality of said laser introduction sections, each of which emits a laser beam that is condensed at a corresponding condensing position in

a vicinity of corresponding front focal positions of the condenser lens; and

wherein the microscope further comprises:

at least one additional image pick-up device which picks up an image of the light taken into the objective lens;

at least one additional observation optical path via which the light taken into the objective lens is condensed onto the additional image pick-up device;

an optical dividing system which divides the light taken into the objective lens onto respective ones of the optical paths toward the image pick-up devices depending on optical characteristics of the light.

Claims 21 and 22 (Canceled).

23. (Withdrawn) The total internal reflection fluorescence microscope according to clam 21, wherein each of the plurality of laser introduction sections comprises a conversion lens unit which coverts a numerical aperture of the laser beam incident upon the condensing position without changing the condensing position of the laser beam.

24. (Withdrawn) The total internal reflection fluorescence microscope according to claim 23, each said conversion lens unit is removably inserted between an emission end of the optical

fiber and the condensing lens in the corresponding one of the laser introduction sections.

25. (Withdrawn) The total internal reflection fluorescence microscope according to claim 23, wherein each said conversion lens unit includes a lens group which converts a numerical aperture of the laser beam incident upon the corresponding condensing position.

26. (Withdrawn) The total internal reflection fluorescence microscope according to claim 23, each said conversion lens unit comprises:

a convex lens which converts the numerical aperture of the laser beam diverged and emitted from an emission end of the optical fiber in the corresponding one of the laser introduction sections; and

a concave lens which diverges the laser beam having the numerical aperture converted by the convex lens.

27. (Withdrawn) The total internal reflection fluorescence microscope according to claim 26, wherein each said concave lens is movable in an optical path direction of the laser beam between the convex lens and the condensing lens in the corresponding one of the laser introduction sections.

28. (Withdrawn) The total internal reflection fluorescence microscope according to claim 24, wherein the at least one objective lens comprises a plurality of objective lenses having different observation magnifications, and the microscope further comprises:

an objective lens switching section which selectively disposes one of the plurality of objective lenses to take the light from the specimen; and

a control section which controls inserting and removing of the conversion lens unit in each of the plurality of laser introduction sections between the emission end of the optical fiber and the condensing lens in accordance with the observation magnification of the objective lens disposed to take the light from the sample.

29. (Withdrawn) The total internal reflection fluorescence microscope according to claim 28, wherein a plurality of objective lenses include at least one objective lens for high-magnification observation and at least one objective lens for low-magnification observation, and

wherein the control section inserts the conversion lens unit in each of the plurality of laser introduction sections between the emission end of the optical fiber and the condensing lens when the objective lens for high-magnification observation is

disposed to take the light from the sample, and removes the conversion lens unit in each of the plurality of laser introduction sections between the emission end of the optical fiber and the condensing lens when the objective lens for low-magnification observation is disposed to take the light from the sample.

30. (Withdrawn) The total internal reflection fluorescence microscope according to claim 29, wherein, for each of the laser introduction sections, an irradiation range of the laser beam with respect to the specimen is caused to agree with an observation range of the objective lens for high-magnification observation when the conversion lens unit is inserted between the emission end of the optical fiber and the condensing lens, and the irradiation range of the laser beam with respect to the specimen is caused to agree with an observation range of the objective lens for low-magnification observation when the conversion lens unit is inserted between the emission end of the optical fiber and the condensing lens.

31. (Withdrawn) The total internal reflection fluorescence microscope according to claim 20, wherein each of the plurality of laser introduction sections further comprises a zoom lens

unit which adjusts the condensing position of the laser beam in the vicinity of the front focal position of the condenser lens.

32. (Withdrawn) The total internal reflection fluorescence microscope according to claim 31, wherein each said zoom lens unit comprises a lens group which adjusts the condensing position of the laser beam in the vicinity of the front focal position of the condenser lens.

33. (Withdrawn) The total internal reflection fluorescence microscope according to claim 31, wherein the lens group of each said zoom lens unit comprises:

a convex lens which converts the numerical aperture of the laser beam diverged and emitted from an emission end of the optical fiber in the corresponding laser introduction section; and

a concave lens which diverges the laser beam having the numerical aperture converted by the convex lens.

34. (Withdrawn) The total internal reflection fluorescence microscope according to claim 33, wherein each said convex lens is movable in an optical path direction of the laser beam between the emission end of the optical fiber and the condensing lens in the corresponding one of the laser introduction sections.

35. (Withdrawn) The total internal reflection fluorescence microscope according to claim 33, wherein each said concave lens is movable in an optical path direction of the laser beam between the convex lens and the condensing lens in the corresponding one of the laser introduction sections.

36. (Withdrawn) The total internal reflection fluorescence microscope according to claim 33, further comprising:

a control section which determines, for each said zoom lens unit, a moving position of the concave lens to adjust the condensing position of the laser beam in the vicinity of the front focal position of the condenser lens in accordance with positional movement of the convex lens, and which controls movement of the convex lens and the concave lens based on information of the determined moving position of the concave lens.

37. (Withdrawn) The total internal reflection fluorescence microscope according to claim 32, wherein the at least one objective lens comprises a plurality of objective lenses having different observation magnifications, and the microscope further comprises:

an objective lens switching section which selectively disposes one of the plurality of objective lenses to take the light from the specimen; and

a control section which determines a relative positional relation of the lens groups disposed in the zoom lens units in each optical axis direction in accordance with an observation magnification of the objective lens disposed on the observation optical path.

38. (Withdrawn) The total internal reflection fluorescence microscope according to claim 37, wherein the lens group of each said zoom lens unit comprises:

a convex lens which converts the numerical aperture of the laser beam diverged and emitted from an emission end of the optical fiber in the corresponding laser introduction section; and

a concave lens which diverges the laser beam having the numerical aperture converted by the convex lens, and

wherein, for each of the zoom lens units, the control section determines a moving position of the concave lens to adjust the condensing position of the laser beam in the vicinity of the front focal position of the condenser lenses in accordance with positional movement of the convex lens, and the control section controls movement of the convex lens and the concave lens

based on information of the determined moving position of the concave lens.

39. (Withdrawn) The total internal reflection fluorescence microscope according to claim 20, wherein the plurality of laser introduction sections are disposed radially around the transmitted illuminative light path and extend in directions that are substantially perpendicular to a path of the transmitted illuminative light.

40. (Withdrawn) The total internal reflection fluorescence microscope according to claim 20, further comprising:

at least one optical path length adjustment section which is disposed on at least one divided observation optical path among the plurality of divided observation optical paths divided by the optical dividing system and which extends and contracts an optical path length.

41. (Withdrawn) The total internal reflection fluorescence microscope according to claim 40, wherein the optical path length adjustment section comprises:

a fixed prism group fixed/disposed on the divided observation optical path; and

a movable prism which is movable away from and toward the fixed prism group.

42. (Withdrawn) The total internal reflection fluorescence microscope according to claim 40, further comprising:

a control section which calculates/processes an extension/contraction of the optical path length by the optical path length adjustment section.

43. (Withdrawn) The total internal reflection fluorescence microscope according to claim 20, further comprising:

a plurality of shutters disposed in the plurality of laser introduction sections; and

a control section which controls opening and closing of the plurality of shutters to control introducing and blocking of the laser beams from the laser introduction sections.

44. (Withdrawn) The total internal reflection fluorescence microscope according to claim 20, wherein the plurality of laser introduction sections includes at least two laser introduction sections which output laser beams a same wavelength.

45. (Currently Amended) A total internal reflection fluorescence microscope comprising:

at least one objective lens which takes light from a specimen;

an image pick-up device which picks up an image of the light taken into the objective lens;

an observation optical path via which the light taken into the objective lens is condensed onto the image pick-up device;

a condenser lens, which is disposed in a position facing the objective lens via the specimen, which has a numerical aperture that makes possible total internal reflection illumination, and which guides a transmitted illuminative light, which is emitted by a light source, into the specimen;

a base including an upper portion that holds the condenser lens;

a laser oscillation unit which outputs a laser beam;

a laser introduction section which comprises a reflection mirror provided at a lower portion of the base to ~~introduce~~ reflect the laser beam output from the laser oscillation unit along a path substantially parallel to a light path of the transmitted illuminative light from the light source, so as to introduce the laser beam into a vicinity of an outermost ~~portion~~ side of the condenser lens; and

a mirror moving section which moves the reflection mirror in a translatory manner in a direction that is substantially perpendicular to ~~a~~ the light path of the transmitted illuminative

light from the light source, such that when the mirror moving section moves the reflection mirror, the path of the laser beam reflected by the reflection mirror remains substantially parallel to the light path of the transmitted illuminative light;

wherein when the mirror moving section moves the reflection mirror, an incidence angle, at a boundary of the specimen, of the laser beam emitted from the condenser lens is changed, thereby changing a leak-out depth of evanescent light that illuminates the specimen.

46. (Currently Amended) A total internal reflection fluorescence microscope comprising:

at least one objective lens which takes light from a specimen;

an image pick-up device which picks up an image of the light taken into the objective lens;

an observation optical path via which the light taken into the objective lens is condensed onto the image pick-up device;

a condenser lens, which is disposed in a position facing the objective lens via the specimen, which has a numerical aperture that makes possible total internal reflection illumination, and which guides a transmitted illuminative light, which is emitted by a light source, into the specimen;

a laser oscillation unit which outputs a laser beam;

a laser introduction section which comprises a reflection mirror provided integrally at a lower portion of the condenser lens to ~~introduce~~ reflect the laser beam output from the laser oscillation unit along a path substantially parallel to a light path of the transmitted illuminative light from the light source, so as to introduce the laser beam into a vicinity of an outermost ~~portion~~ side of the condenser lens; and

a mirror moving section which moves the reflection mirror in a translatory manner in a direction that is substantially perpendicular to ~~a~~ the light path of the transmitted illuminative light from the light source, such that when the mirror moving section moves the reflection mirror, the path of the laser beam reflected by the reflection mirror remains substantially parallel to the light path of the transmitted illuminative light;

wherein when the mirror moving section moves the reflection mirror, an incidence angle, at a boundary of the specimen, of the laser beam emitted from the condenser lens is changed, thereby changing a leak-out depth of evanescent light that illuminates the specimen.